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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/858,327	05/15/2001	Leroy J. Ohlsen	690089.401C5	3577

31740 7590 03/01/2004
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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/858,327

Applicant(s)

OHLSEN ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 41-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 41-44 is/are allowed.
- 6) ☒ Claim(s) 45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 23, 2004 has been entered. This Office action addresses newly added claims 41-45. Claims 41-44 are allowed, and claim 45 is rejected under 35 USC §103. This action is non-final.

Claim Rejections - 35 USC § 103

2. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over FR 2667728 in view of Mercuri et al (U.S. Patent 6,413,671) in view of Mercuri et al (U.S. Patent 6,528,199) in view of Wilkinson et al (U.S. Patent 5,874,182).

Regarding claim 45, the French reference is generally directed to a fuel cell system comprising an electrode assembly (see abstract; Figure 1). The assembly comprises an anode, cathode and electrolyte (3, 9). Each electrode comprises a plurality of pores (6, 7) having catalyst particles (8) noncontiguously dispersed thereon (see Fig. 1). The catalyst particles are capable of being contacted by gaseous reactants (see Fig. 3).

The French reference does not expressly teach that the electrodes have a fluid delivery channel disposed across a first face and a fluid removal channel disposed across a second, opposing face, as recited in claim 45. The reference also does not teach that the fuel cell is a liquid feed fuel cell having a fluid reactant and electrolyte contained within the electrode and which flows from the delivery channel to the removal channel, as recited in claim 45.

The patent of Mercuri et al '671 is directed to graphite electrodes for fuel cells. In Figures 3, 6, and 7, the reference teaches channels (5) on the surface of the electrode facing the electrolyte that are in fluid communication with linear acicular pores (20) in the electrode.

The artisan would be motivated by the disclosure of Mercuri et al. '671 to incorporate fluid removal channels on the inner (electrolyte) side of the electrodes of the French reference because in column 7, line 9, Mercuri et al. '671 teach that "in the event of a blockage in a channel 20, such as indicated at 7 in FIGS. 6 and 7, fluid from adjacent channels can flow through grooves 5 so that gas-catalyst contact adjacent the blocked channel is maintained." Accordingly, this would provide sufficient motivation to incorporate channels onto the inside surface of the electrodes of the French reference.

The patent of Mercuri et al. '199 is also directed to graphite electrodes for fuel cells. In Figures 6, 9, and 10, the reference teaches channels (30) on the outside surface of the electrode that are in fluid communication with linear acicular pores (20) in the electrode.

The artisan would be motivated by the disclosure of Mercuri et al '199 to incorporate fluid removal channels on the outer side of the electrodes of the French reference because in column 9, line 12, Mercuri et al '199 teach that "particular advantages of the present invention

when used in a fuel cell are high thermal dissipation at the periphery of the electrode, which minimizes the requirement for cooling elements in the cells, as well as providing a relatively thin electrode and elimination of the need for one or both flow field plates.” Accordingly, this would provide sufficient motivation to incorporate channels onto the outside surface of the electrodes of the French reference.

The patent of Wilkinson et al. is directed to a method and apparatus for reducing reactant crossover in a fuel cell (see abstract). In column 8, line 21, the reference teaches that methanol may be supplied to the anode in an aqueous acid solution.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Wilkinson et al. to feed an aqueous methanol/acid solution to the anode, and thereby to the electrolyte, of the French reference. In column 2, line 15, Wilkinson et al. teach that such an aqueous solution “is the preferred feed” to the anode. Accordingly, the artisan would be motivated to feed an aqueous methanol/acid solution to the anode, and thus to the electrolyte, of the French reference. Such feeding of a liquid reactant/electrolyte mixture would also meet the limitation in the instant claim that the mixture flows from the fluid delivery channel to the fluid removal channel in the electrode. Further, the liquid mixture would be capable of contacting the surface-adhered catalyst particles (8) of the French reference, as recited in claim 45.

Response to Arguments

3. Applicant's arguments filed January 23, 2004 have been fully considered insofar as they are applicable to the present rejection, but they are not persuasive. Applicants assert that "the present invention as recited in claim 45 requires that a flowing reactant and electrolyte mixture contact surface adhered catalyst particles; the electrode structure of FR 2667728, on the other hand, requires a polymeric coating over its surface adhered catalyst particles and therefore a flowing reactant and electrolyte mixture cannot contact its surface adhered catalyst particles." In response, it is noted that the French reference expressly teaches in Figure 3 that a gaseous reactant (oxygen) contacts the catalyst particles. It would reasonably follow that any liquid reactant flowing through the electrode would also be capable of diffusing through the polymer layer and contacting the catalyst particles. This would be particularly true for an aqueous liquid, since the NAFION® layer of the French reference is a hydrophilic material. Further, it would be necessary for the reactant liquid to come into contact with the catalyst for the fuel cell to be operable. As such, the claimed feature of the liquid contacting the catalyst is still not considered to distinguish over the French reference.

Allowable Subject Matter

4. Claims 41-44 are allowed.
5. The following is an examiner's statement of reasons for allowance:

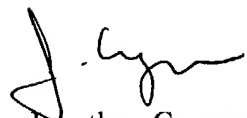
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The reasons for allowance of the instant claims were given in the Office action of April 4, 2003 and remain applicable herein.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.



Jonathan Crepeau
Patent Examiner
Art Unit 1746
February 23, 2004